

REMARKS

The Advisory Action dated December 11, 2007 has been received and carefully noted. The above amendments to the claims, and the following remarks, are submitted as a full and complete response thereto.

Claims 1-4, 8, 15-17, 20, 22 and 27-28 have been amended to more particularly point out and distinctly claim the subject matter of the invention. Claims 29-30 have been newly added. No new matter has been added and no new issues are raised which require further consideration or search.

Claims 1-28 were rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent Publication No. 2003/0086413 to Tartarelli (hereinafter Tartarelli). The rejection is traversed as being based on a reference that neither teaches nor suggests the novel combination of features clearly recited in claims 1-28.

Claim 1, upon which claims 2-7 depend, recites a method including receiving a packet and determining a number of tokens in a token bucket. The method also includes calculating a probability for marking the received packet with a precedence level when the number of tokens in the token bucket is between a first threshold and a second threshold and marking the packet for a particular forwarding treatment using at least one token bucket. In addition, there is an increased probability of marking the packet with a higher precedence level than a previously marked packet if the previously marked packet had a low precedence level.

Claim 8, upon which claims 9-14 depend, recites a packet marking system including a receiving engine configured to receive a packet to be marked. The system

also includes a marker engine, communicatively coupled to the receiving engine, configured to determine the number of tokens in a token bucket. The system further includes a probability engine, communicatively coupled to the marker engine, configured to calculate a probability to be used to mark the received packet with a precedence level when the number of tokens in the token bucket is between a first threshold and a second threshold. The marking engine is configured to mark the packet for a particular forwarding treatment using at least one token bucket. In addition, there is an increased probability of marking the packet with a higher precedence level than a previously marked packet if the previously marked packet had a low precedence level.

Claim 15 recites a computer-readable medium having stored thereon instructions for a processor to execute a method. The method includes receiving a packet, and determining a number of tokens in a token bucket. The method also includes calculating a probability for marking the received packet with a precedence level when the number of tokens in the token bucket is between a first threshold and a second threshold and marking packet for a particular forwarding treatment using at least one token bucket. In addition, there is an increased probability of marking the packet with a higher precedence level than a previously marked packet if the previously marked packet had a low precedence level.

Claim 16 recites a system including receiving means for receiving a packet and determining means for determining a number of tokens in a token bucket. The system also includes calculating means for calculating a probability for marking the received packet with a precedence level when the number of tokens in the token bucket is between

a first threshold and a second threshold. The system further includes marking means for marking the packet for a particular forwarding treatment using at least one token bucket. In addition, there is an increased probability of marking the packet with a higher precedence level than a previously marked packet if the previously marked packet had a low precedence level.

Claim 17, upon which claims 18-21 depend, recites a method including receiving a packet and determining a number of tokens in a first token bucket. The method also includes determining a precedence value for marking the packet based on the determined number of tokens. The method further includes upgrading the determined precedence value to a higher precedence value when a pre-specified number of previously received packets were marked with the same determined precedence value and marking the packet for a particular forwarding treatment using at least one token bucket.

Claim 22, upon which claims 23-26 depend, recites system that includes a receiving engine configured to receive a packet and a marker engine, communicatively coupled to the receiving engine, configured to determine a number of tokens in a first token bucket and configured to determine a precedence value used to mark the packet based on the determined number of tokens. The system also includes an upgrade engine, communicatively coupled to the marker engine, configured to upgrade the determined precedence value to a higher precedence value when a pre-specified number of previously received packets were marked with the same determined precedence value. The marking engine is configured to mark packet for a particular forwarding treatment using at least one token bucket.

Claim 27 recites a computer program embodied on a computer readable medium and configured to control a processor to perform receiving a packet and determining a number of tokens in a first token bucket. The method also includes determining a precedence value used to mark the packet based on the determined number of tokens and upgrading the determined precedence value to a higher precedence value when a pre-specified number of previously received packets were marked with the same determined precedence value. The method further includes marking the packet for a particular forwarding treatment using at least one token bucket.

Claim 28 recites a system including receiving means for receiving a packet and token determining means for determining a number of tokens in a first token bucket. The system also includes precedence value determining means for determining a precedence value used to mark the packet based on the determined number of tokens. The system further includes upgrading means for upgrading the determined precedence value to a higher precedence value when a pre-specified number of previously received packets were marked with the same determined precedence value and means for marking packet for a particular forwarding treatment using at least one token bucket.

Claims 29-30 are apparatus claims based on one or more of the above claims.

As outlined below, the cited reference of Tartarelli does not teach or suggest the all of the elements of the pending claims.

Tartarelli discloses a method of transmitting data from customers (C1, C2, C3, C4, C5, C6, C7, C8, C9, C10) over a computer network, in particular over the Internet, where the data to be sent is split into packets, in particular into IP packets. Each packet is

marked by one of at least two states (IN, OUT) and where the states (IN, OUT) determine which packets are dropped first, if packets are dropped during transmission. The marking of the packet with a state of high drop precedence (OUT) is based on a random probability (p). See at least the Abstract of Tartarelli.

In FIG. 4 of Tartarelli, a flow diagram shows the marking of a packet. When the packet enters the network, the token bucket algorithm of FIG. 2 first checks if the packet is within the assigned maximum bandwidth CIR. To this end, the packet length L is compared with the token bucket occupancy b . If the value of the packet length L is greater than the value of the token bucket occupancy b , the packet is marked OUT. If the token bucket occupancy b has enough bytes, the random probability p determines whether the packet is marked IN or OUT. If the probability p is greater than a random number u evenly distributed between 0 and 1, the packet is marked OUT; otherwise it is marked IN. If the token bucket is empty, all packets are marked OUT, independently of the random probability p . See paragraph [0064] of Tartarelli.

Applicants submit that Tartarelli does not teach or suggest each of the elements of the pending claims. Beginning with newly amended claim 1, Applicants submit that Tartarelli does not teach each of the elements of newly amended claim 1.

For instance, claim 1, recites, in part,

“marking the packet for a particular forwarding treatment using at least one token bucket, wherein, there is an increased probability of marking the packet with a higher precedence level than a previously marked packet if the previously marked packet had a low precedence level.”

Tartarelli does not disclose the above recited features of claim 1. Tartarelli is directed to controlling the traffic rate or bandwidth rate of packet flow. Tartarelli proposes

stabilizing token bucket occupancy by introducing a packet marking scheme that is based on a random probability. See paragraph [0065] of Tartarelli. FIG 4 of Tartarelli best illustrates how a single packet is analyzed in each iteration of the packet marking operation. In FIG. 4, the packet length (L) is measured and compared to a byte (b) threshold and then compared to a probability (p) prior to marking the packet as either IN or OUT.

Tartarelli discloses that the packets are analyzed and marked on an individual basis. (Emphasis added) As a result, the probability of marking a packet during the packet marking operation of Tartarelli does not take into consideration any precedence level of a previously marked packet. The packets are marked according to a packet marking determination which is performed independently of previous packet marking operations. The packet marking operation is repeated for each individual packet without regard for the previously marked packet. Furthermore, Tartarelli does not teach or suggest “marking the packet for a particular forwarding treatment using at least one token bucket, wherein, there is an increased probability of marking the packet with a higher precedence level than a previously marked packet if the previously marked packet had a low precedence level.” (Emphasis added)

Therefore, Tartarelli fails to teach all of the elements of independent claim 1, and similarly, independent claims 8, 15-16 and 29. By virtue of dependency, Tartarelli also fails to teach or disclose all of the subject matter of dependent claims 2-7 and 9-14. Withdrawal of the rejection of claims 1-16 is kindly requested.

Regarding claims 17-28, Applicants submit that Tartarelli also fails to teach all of the subject matter recited in claims 17-28. For instance, Tartarelli does not teach

“determining a precedence value used to mark the packet...upgrading the determined precedence value to a higher precedence value when a pre-specified number of previously received packets were marked with the same determined precedence value”, as recited, in part, in claim 17. (Emphasis added)

The Office Action alleged that paragraphs [0023] through [0029] of Tartarelli teach the above noted portion of claim 17. Applicants disagree and submit that none of teachings disclosed in Tartarelli teach all of the subject matter recited claim 17.

Tartarelli discloses, in paragraph [0023], that the traffic bandwidth rate is reduced if packet drops are detected by the transmission control protocol (TCP), and, alternatively, the traffic rate is increased if no packet drops occur. The marking of the packets provides a way to reduce the chances that the bandwidth is reduced so a more optimal bandwidth rate can be achieved.

Paragraph [0024] of Tartarelli provides a formula to calculate the random probability p by incorporating a previous probability p_{old} and bucket occupancy level b_{old} . The values of the random probability (p_{old}) and the bucket occupancy b (b_{old}) are calculated at a previous update time and in turn are used to calculate an updated random probability p . Paragraph [0026] of Tartarelli then concludes with a discussion of the packet marking operation which provides that a packet is marked with a high drop precedence based on a comparison between the probability p (recently calculated) and a random number between 0 and 1. The packet will be marked with a high drop precedence if the calculated probability p is greater than the random number generated.

Further to the subject matter disclosed in Tartarelli, paragraphs [0027] through [0029] simply refer to expressions for changing the TCP window size and token bucket occupancy. The subject matter of Tartarelli teaches that the likelihood of assigning a high drop precedence to a packet is based on the previously calculated random probability (p_{old}) and bucket occupancy b (b_{old}) neither of which are comparable to the upgrading of the precedence value to a higher precedence value “when a pre-specified number of previously received packets were marked with the same determined precedence”, as recited, in part, in claim 17. Tartarelli does not consider any number of previously received packets when marking a packet with a high precedence level. Furthermore, Tartarelli does not disclose any upgrading of a precedence level to a higher precedence value based on previously received packets.

Therefore, Tartarelli fails to teach all of the elements of independent claim 17, and similarly, independent claims 22 and 27-28 and 30. By virtue of dependency, Tartarelli also fails to teach or disclose all of the subject matter of dependent claims 18-21 and 23-26. Withdrawal of the rejection of claims 17-28 is kindly requested.

As noted previously, claims 1-30 recite subject matter which is neither disclosed nor suggested in the prior art references cited in the Office Action. It is therefore respectfully requested that all of claims 1-30 be allowed and this application passed to issue.

If for any reason the Examiner determines that the application is not now in condition for allowance, it is respectfully requested that the Examiner contact, by

telephone, the applicants' undersigned representative at the indicated telephone number to arrange for an interview to expedite the disposition of this application.

In the event this paper is not being timely filed, the applicants respectfully petition for an appropriate extension of time. Any fees for such an extension together with any additional fees may be charged to Counsel's Deposit Account 50-2222.

Respectfully submitted,



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Enclosures: RCE Transmittal
Petition for Extension of Time
Check No. 017768